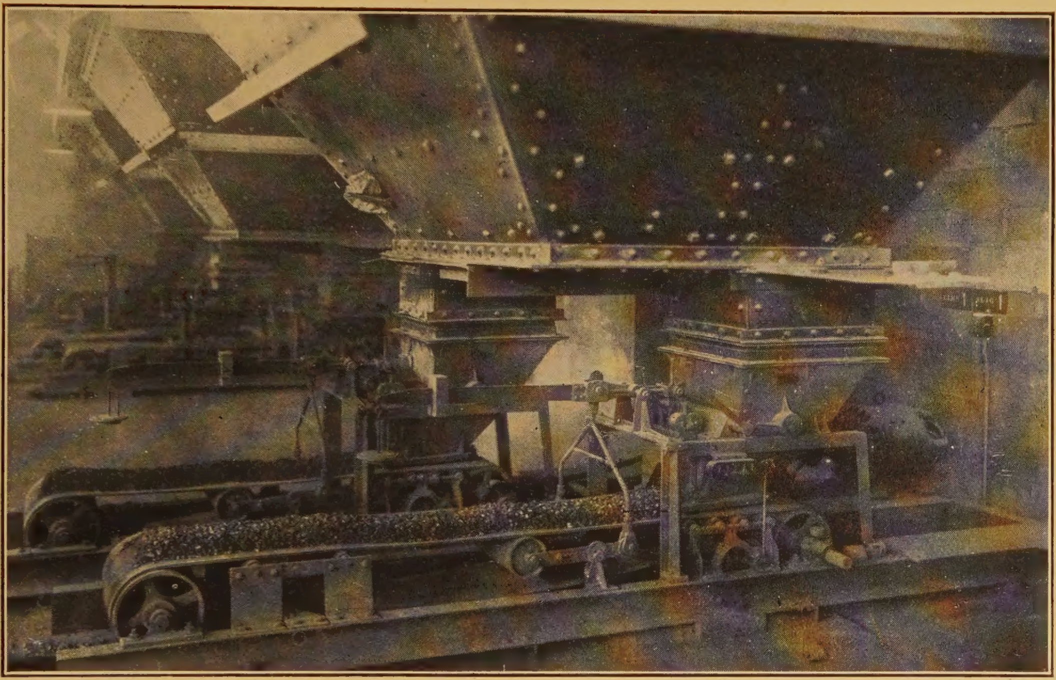
MILL SECTION of
Concrete

Schaffer Poidometers



Photograph showing two of nine Poidometers proportioning various materials and feeding same to compeb mills at the new plant of the Federal Portland Cement at Buffalo, New York

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Polysius Solo Mills and Solo Kilns were ordered in January, 1927

The first cement was produced in July, 1927

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MILL SECTION of

Concrete

The Mill Edition of CONCRETE is edited for the manufacturers of portland cement, lime and similar products. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition.

The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

Volume 31 December, 1927 Number 6

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MILL SECTION of

Concrete

Vol. 31 Chicago, December, 1927 No. 6

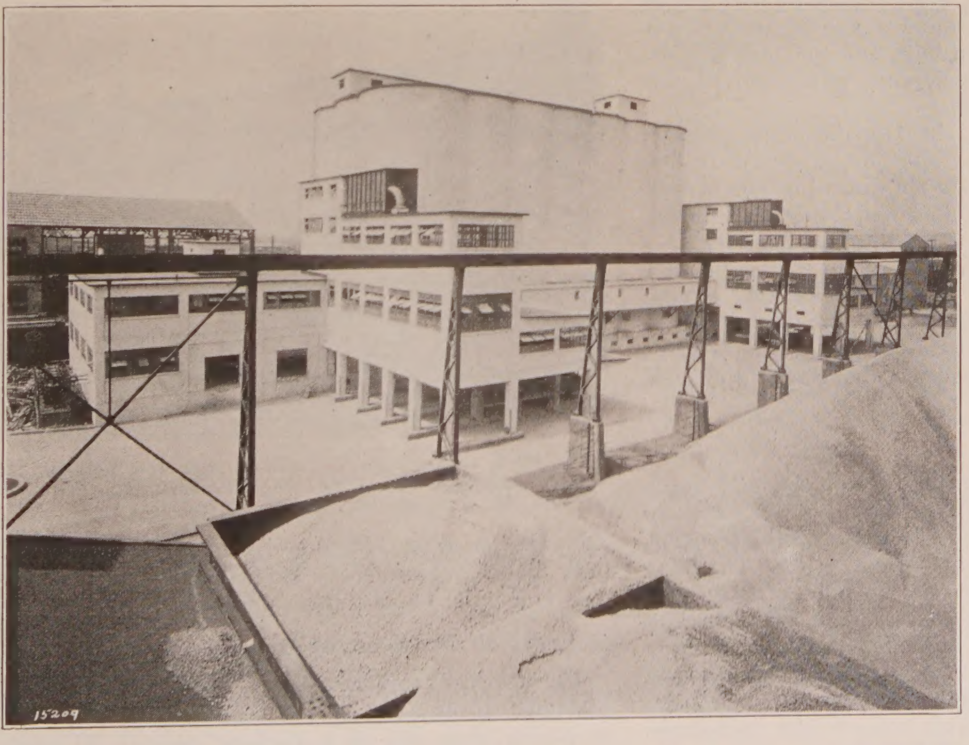
Bulk Cement Shipments by Truck Reduce Delivery Costs

Peerless Portland Cement Company Makes Wholesale Bulk Cement Deliveries by Motor Truck in Detroit—A New Merchandising Development—Is Practical and Economical—Type of Truck Used—Delivers 80 Per Cent of Output by Truck—Costs

ALTHOUGH the shipping of cement in bulk is not new and the adaptation of the motor truck for cement deliveries has proved an important factor in the development of the modern cement industry, the use of motor trucks for making wholesale deliveries of loose cement in bulk appears to offer possibilities not yet completely developed. The method of making truck shipments of cement in bulk seems all the more interesting in view of the fact that in the recent past the tendency has been toward locating new cement plants as near as possible to the important markets to be served, rather than depending upon the long railroad hauls which increase the price to the consumer. Specially designed equipment for making bulk cement shipments by truck is being used in Detroit.

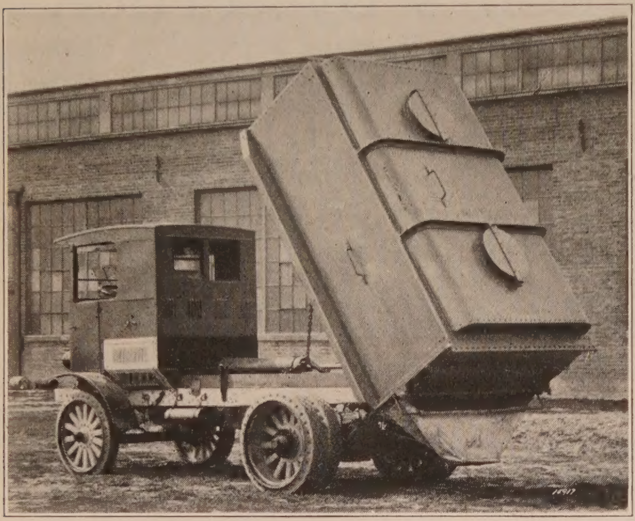
Bulk Cement Transportation in Michigan

Michigan cement manufacturers, particularly those with headquarters in Detroit, have pioneered in the transportation of bulk materials including both raw materials for cement manufacture and the finished cement. A number



The Peerless Portland Cement Company's warehouse and packing department. The loading equipment is simple, consisting of a canvas chute which conveys the cement directly from an automatic weighing machine located in the packing house above the truck loading platform of bulk freighters are being operated on the Great Lakes delivering several thousand tons of bulk stone per cargo to mills located at different ports on the Great Lakes or their contiguous waters.

The Peerless Portland Cement Company's plant is one of the several plants on the lakes that has been centrally located with respect to the possible market for cement and depends upon bulk transportation of the raw materials by water. The Peerless company has pioneered in developing the method of making bulk cement deliveries by truck in the Detroit district. It has demonstrated that it is not only practical but economical to deliver loose cement in bulk by means of specially equipped motor trucks.



Type of truck used for hauling bulk cement direct from the cement plant to the job

When the question was raised concerning the practicability of hauling loose cement and abandoning the method of hauling in sacks and bags, some skepticism was voiced but the Peerless company desired a speedy method for handling wholesale cement in bulk and the specially designed motor truck was developed which solved the company's immediate problems.

The main difficulties anticipated included the possible deterioration of the cement due to exposure to the weather in transit, and difficulty in unloading the cement from the truck after being jolted and compacted during the time it was being hauled to the delivery point.

Contrary to expectations, it was found that even after being jolted and compacted by a trip over city streets, the bulk cement flowed freely from the discharge end with the dump body elevated at an angle of 20 to 25 degrees, and could be completely unloaded without the aid of slice bars.

Type of Truck Used

Each unit consists of a specially designed end dump body, manufactured by the Wood Hydraulic Hoist & Body Co. of Detroit, mounted upon a 120-inch wheelbase chassis made by the Autocar Company, Ardmore, Pa. The body consists of a steel tank with two manholes in the top through which the cement is loaded. The manholes are fitted with watertight covers insuring absolute protection during the hauling. Cement is loaded at the Peerless plant under cover. The loading equipment is simple, consisting of a canvas chute which conveys the cement directly from an automatic weighing machine made by the Buffalo Scale Co. and located in the packing house above the truck loading platform.

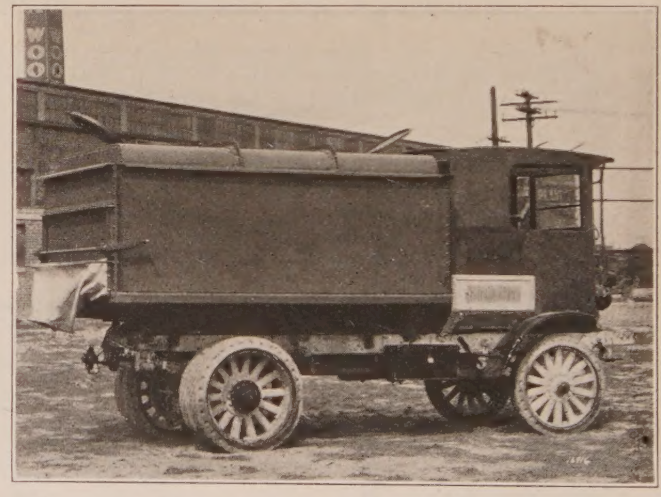
The capacity of the bulk weighing machine is 16,000 pounds and each charge of cement empties through the canvas chute which is extended through one of the manholes in the truck body. A truck load equivalent to 60 barrels of cement is discharged from the weighing machine into the truck in five minutes. In unloading, the cement is discharged through a waterproof canvas chute attached to the rear end of the tank.

Delivering Bulk Cement

Products plants and building contractors have found the method economical. The only provision required at the point of delivery, other than that required to receive deliveries in sacks, is a ramp and hopper to receive the bulk cement. The truck is backed up the ramp and the cement discharged into the hopper from whence it can pass into the boot of an elevator discharging into the storage. When delivered in bulk, the proper storage of the cement on the job approximates the conditions under which large stocks of cement are stored at the mills.

There are about 130 products plants in the Detroit district. The usual method of supplying cement for these plants involves the emptying of from 50 to 150 barrels of cement out of the sacks into the storage hoppers from which it is drawn to supply the mixers.

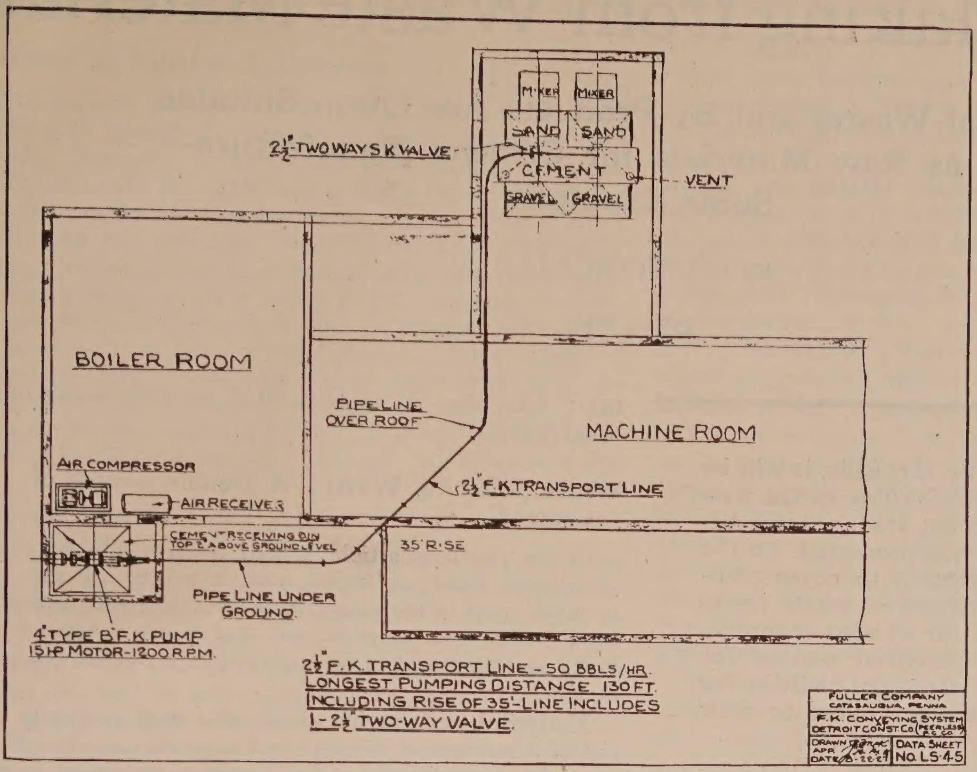
The Peerless plant is located within the city limits of Detroit and is situated on one of the main east and west thoroughfares near the Detroit River front. It was built on the property formerly occupied by a lumber yard. Economy in the handling of materials was kept in mind in the design and layout of the plant, and this idea was particularly incorporated in the packing plant. The prevention of possible dust nuisance that would result from excess dust escaping from the plant is an important factor in view of the fact that the plant is in such close proximity to the street and to city traffic. A concrete retaining wall separates the clinker storage from the sidewalk on West Jefferson Avenue. The fact that the bulk loading of cement is carried on practically without dust is a point of advantage under the circumstances.



Cement is loaded into the truck through two manholes fitted with watertight covers. A truck load is about 60 barrels

Delivers 80 Per Cent of Output by Truck

The Peerless company delivers 80 per cent of its output by truck. From 55 to 60 per cent of these shipments are in paper sacks and at a packing cost of 20 cents per barrel, of which 15 cents per barrel is paid by the customer. The method of making bulk deliveries by truck has been in operation for about a year and bulk deliveries



This system of handling bulk cement at the receiving end is used by the Detroit Construction Company. The trucks dump the bulk cement into a pit hopper from which it is transported by a Fuller-Kinyon pump to the overhead bins above the mixers

have gradually increased from the time the method was first inaugurated.

Among the chief economies mentioned as incident to the bulk deliveries are: The time saved in loading trucks; saving in packing charges; reduction of dust; elimination of time and labor generally expended in loading and unloading bags of cement. The Peerless company estimates that the bulk handling results in a saving of 5 cents per barrel in packing charges and 4 cents per barrel in sack losses.

The savings in cost of delivering cement to the job are important in view of the fact that cement manufacturers have to depend upon a large volume of business for profit because the product sells for a lower price per pound than any other highly scientifically manufactured product. As evidenced by statistics for 1926, cement manufacturing plants have been located in 30 states, thus tending to manufacture the product near to the most important consuming markets.

The potential possibilities for savings to consumers receiving bulk cement deliveries obviously depend upon the method and the equipment for receiving the bulk shipments. One building contractor engaged in the construction of a large reinforced concrete building requiring about 50,000 barrels of cement reported a saving of about $42,000. The work of eight or nine men was eliminated due to the bulk deliveries. The cost of the ramp and special receiving equipment was estimated to be less than $1,000.

It is difficult to estimate the ultimate possibilities which the bulk delivery method and equipment offer. The method has been tried out in the Detroit district only in the fields of products manufacture and the building contractor. No definite study has been made of the adaptability of bulk deliveries to road construction or in connection with other public improvements in the immediate locality, and the method has not been adopted by other companies serving the same territory.

As an indication of the volume of cement trucked from the mills directly to the jobs for the Detroit Department of Public Works, it is interesting to note that the records of the City Department of Purchases and Supplies show that the city contracted with the Huron Portland Cement Company for 300,000 barrels of portland cement for the 1927 construction season, to be supplied from the Detroit, River Rouge or Wyandotte plants. A separate contract with the Michigan Transportation Company provides for hauling the cement to any part of the city designated, the cartage being 19 cents per barrel if hauled from Wyandotte, 15 cents if hauled from River Rouge and 12 cents per barrel if hauled from the foot of Riopelle Street, Detroit. These deliveries are all in cloth or paper sacks, the contract price being based upon quotations f.o.b. the mills for cement in both cloth and paper containers.

Cement Industry to Be Discussed at Spring Conference in Northampton County

The cement industry of Northampton county will be given prominent place at a conference to be held at Lafayette College, Northampton County, Pennsylvania, some time in the spring.

A three-day gathering is planned, for which it is hoped to secure as speakers such men as Herbert Hoover, Charles M. Schwab, and Hon. John Fisher, governor of Pennsylvania.

Regional conferences of a number of technical societies will be held at the college at the same time. Slate and steel are other industries that will be discussed.

The program is in the charge of Professor Wm. B. Plank, head of the Mining Engineering Department at Lafayette College, who is working with D. Knickerbocker Boyd, Philadelphia architect and secretary of Committee D-16 of the American Society for Testing Materials.

Cement Making from Waste Materials

Industrial Wastes and By-Products Are Often Suitable for Use as Raw Materials for Cement Manufacture—Some Examples

By E. T. ELLIS, F.J.I.

Part II

In a previous article by Mr. Ellis, it will be remembered, a very brief outline of the possibilities of making cement from several different waste materials was presented. In the present paper it is proposed to cover additional industrial by-products or waste materials that are valuable for cement manufacturing. The use of industrial wastes for cement raw materials offers possibilities for the location of cement plants close to their principal markets.

Preparation of Parian Cements from Old Wall Plaster

In demolishing old buildings prior to the erection of new ones, a very imposing volume of old wall plaster accumulates. At the present time little if anything is done to work it up, but cement manufacturers should arrange with building contractors to take all they can get on account of its being extremely valuable in the manufacture of special parian cements.

The borax required also in the preparation of these varieties can also be obtained from waste material, but in the present article I have no space to describe how this is done. The process consists of calcining it at a low temperature, and after grinding it between rollers it is fit then to be worked up into parian cements in the usual way.

Parian Cements from Superphosphate Factory Residues

It may be useful to give a second source of raw material for the manufacture of parian cements, and this is found in a bulky residue which often proves a troublesome by-product in fertilizer factories producing the so-called double superphosphate.

The raw materials here are generally either mineral coprolites or bones. Very often rock phosphate is employed, but in any of these instances the same bulky residue is produced in the treatment of the material with sulphuric acid in order to produce the soluble superphosphate. The by-product is much to be desired, and being somewhat heavy, sinks to the bottom of the vats very readily during the preparation. During the washing operations which are necessary to free it both from phosphoric acid and surphuric acid, it also settles rapidly.

After washing it several times in cold water, it should be carefully dried, and then calcined at a low temperature. After that it can be worked up with borax in the usual way.

Water Softening Waste: A Double Source of Cement

In the previous article it will be remembered that I mentioned water softening was a source of the lime so much used in the preparation of calcareous cement. I should like now, to point out that many forms of this bulky residue ought to be regarded as a double source of cement.

Analytical examination shows that they generally consist of a mixture of calcium and magnesium salts. If the precipitant employed has been sodium carbonate (a very usual one) it follows that the lime and magnesium will be precipitated as the insoluble carbonate and basic carbonate.

Separation of mixed magnesium and calcium carbonates is an easier matter than may be supposed, and it is desirable in the manufacture of most classes of cement to work up the two independently. After, therefore, filtering off the insoluble residue, cement makers are recommended to treat it with sulphuric acid. Mechanical agitation is almost essential, and should be carried out over a period of several hours, to be sure that the whole of the carbonate has been decomposed.

On allowing the liquid to settle, insoluble calcium sulphate settles to the bottom, and the solution contains magnesium sulphate which dissolves readily in water. This, therefore, can be siphoned off, and the magnesium again precipitated in the form of basic carbonate, though, of course, other precipitants can be employed if preferred, while the already precipitated calcium sulphate is carefully washed, dried, and worked up into parian or selenitic cements in the usual way.

Calcareous Cements from Chemical Firms' Works Waste

I mentioned in my first article that calcium carbonate for the production of calcareous cement was a by-product in numerous chemical processes. Two of these seem to be worthy of rather more comment in the present article, as the carbonate is available in a magnificently pure state, or it can very easily be gotten into a thoroughly clean condition.

The two processes which I have in mind are first the production of potassium chlorate, and secondly, the production of nitric acid from the nitrogen of the air.

Taking the potassium chlorate process first, cement makers will probably be aware of the fact that it is usual to prepare calcium chlorate as the initial step, for technical reasons into which I need not enter. This calcium chlorate is then decomposed by means of potassium carbonate, with the result that potassium chlorate remains in solution, and insoluble calcium carbonate is precipitated.

Washing of Calcium By-Product

This residue is liable to be contaminated to a small extent with potassium chlorate and with potassium carbonate. However, as both these salts dissolve in water easily, although the carbonate is the more soluble of the two, the chalky calcium by-product is very easily freed from these two unwanted salts. Here again washing in large mechanically-agitated vats is advisable, but owing to the absence of free acid, metal vats can be employed, instead of porcelain ones or cement tanks which are necessary in the previous process. After satisfying themselves that the impurities have been removed (this being done with the usual reagents) the precipitated calcium carbonate is carefully dried. It is not calcined until after it has been mixed with the clay in the usual way.

Calcium Nitrate

As to the second process, the production of nitric acid from the nitrogen of the atmosphere is still perhaps in its infancy, although it is practised on a large scale in some parts of the world. This process virtually consists of acting upon limestone suspended in solution by nitric oxides obtained by passing electric sparks through a current of air. Calcium nitrate is thereby produced. After this there are two ways of working; either the calcium nitrate can be transformed into sodium nitrate by treatment with sodium carbonate, whereby insoluble calcium carbonate is precipitated and can be worked up into calcareous cement, or conversely the calcium nitrate is treated with strong sulphuric acid, whereby nitric acid in a pure state is released, and calcium sulphate remains in the retort, which in its turn is available for the preparation of selenitic and parian cements. It will thus be seen that the more nitric acid that is produced the greater is the amount of cement which can in addition be manufactured, although at first sight cement makers would hardly imagine that the two industries had anything in common.

Lime for Building Cement from an Alkali By-Product

Brief reference only need be made to this, as the process is a very straightforward one.

Caustic soda is manufactured by a large number of processes, but the one I have in mind consists of decomposing sodium carbonate (which is now producible from waste ammonia and waste carbon dioxide) by boiling it with milk of lime.

If this is done, double decomposition takes place, i. e., the carbonate of the soda ash changes places with the hydroxide of the milk of lime. An insoluble precipitate of carbonate of lime which settles rapidly is obtained, and caustic soda remains in solution.

This building cement raw material is, as goes without saying, liable to be contaminated not merely with caustic soda but also with caustic lime. Repeated washing will remove the first named impurity, but the presence of the second is not, as a rule, objected to. After washing in mechanically agitated vats, the carbonate is carefully dried, and is not calcined until after it has been mixed with clay, etc.

At least another half dozen trade wastes are of very great value as cement making materials. For instance a residue of the tinplate industry can with great facility be worked up, and proves an extremely cheap cement making material when certain formulae are followed.

British Cement Works Reorganized and Enlarged

A company has been incorporated in England under the title of Oxford & Shipton Cement, Ltd., to acquire the Oxford Portland Cement Co., Ltd., of Kirtlington, Oxfordshire. The new company has a share capital of £500,000 divided into 500,000 ordinary shares of £1 each. There has been an issue of 400,000 shares, and there is a loan capital of £100,000 first mortgage debenture, which the British government is guaranteeing under the Trade Facilities Acts. Among an imposing board of directors are Sir John Brunner, Bart., and Henry Mond, both directors of the £65,000,000 ($325,000,000) chemical combine recently incorporated under the name of Imperial Chemical Industries, Ltd.

The new company is to take over the management and works of its predecessor. The existing works have been manufacturing a high grade portland cement for which there is an increasing demand with which it has been found impossible to cope. It has, therefore, become necessary to build additional works on a neighboring site which has been acquired for the purpose. It is proposed to erect new works capable of manufacturing an additional 125,000 tons annually.

The works are located on the Oxford Canal, about two miles from Bletchington depot, Great Western Railway, and about eight miles from Oxford. The whole of the raw material is obtained from a quarry immediately adjoining the plant. Coal is brought by canal from the Midlands and cement is sent away by road and also canal to Bletchington depot, and thence by rail. The three leasehold sales lots are favorably located on canals in direct communication with the works, and each has an established sales organization.

The whole of the material in the quarry is usable except only about one foot of overburden. The raw material on the freehold property alone is sufficient to supply the works, with its present output of 20,000 tons a year, for many decades. In addition the company holds leasehold rights over 193 acres.

The works is equipped for the dry process and has its own power supply. The cement produced bears a good reputation and is much superior to the requirements of the British Standard Specification.

Owing to the increasing demand, it was necessary to provide for a large increase in output. After a careful examination of all its properties, the best course was decided to be to build a complete new works on the site at Shipton-on-Cherwell, about two miles from the existing works. In this new plant, which will be equipped with two large rotary kilns, it will be easy to produce on the most economical lines an additional 125,000 tons a year, and have ample margin for future extensions.

This site has an area of 216 acres, the greater part of which contains the same kind of raw materials as those used at Kirtlington. It has a ready siding access to the railway, is close to the depot, and has canal and main road transport facilities. The canalized River Cherwell, passing through the property, provides not only an abundant supply of water both for power and manufacturing purposes, but also provides cheap access by water to the important markets in the Midland area. An existing quarry, called "Bunkers Hill," provides a long and deep face ready made. For the output contemplated, there is enough raw material, royalty free, to last over 70 years.

Coal, suitable for use in rotary kilns, can be obtained readily from the Midlands, either by canal or rail, at a present average price of 16s. ($4.00) per ton delivered.

Test Dustproof Qualities of Sealed Sleeve Bearings

A 214-Day Test Made to Determine Whether Sealed Sleeve Bearings Will Exclude Dust from Motors Under Cement Plant Conditions—The Results of the Test

By R. W. SCHUCK
Motor Engineering Department, Westinghouse Electric & Manufacturing Company

IN an effort to determine the effectiveness of sealed sleeve bearings in excluding dust, dirt and grit from electric motor bearing surfaces the Westinghouse Electric and Manufacturing Co. recently conducted a test of the bearings under conditions considered to be the most severe likely to be encountered in a cement mill. This test, which covered a period of 214 days, is described in the following paragraphs. It showed that dust, dirt and grit were very effectively excluded by the bearing housings, also that the amount of wear of the bearings was negligible.

Test Conditions

The motor was housed in a wood box, 5 feet long by 3 feet high by 3 feet wide. The hinged top of the box was provided with locks, so that the motor could not be tampered with during the test. Figure 1 shows the box with top closed and locked.

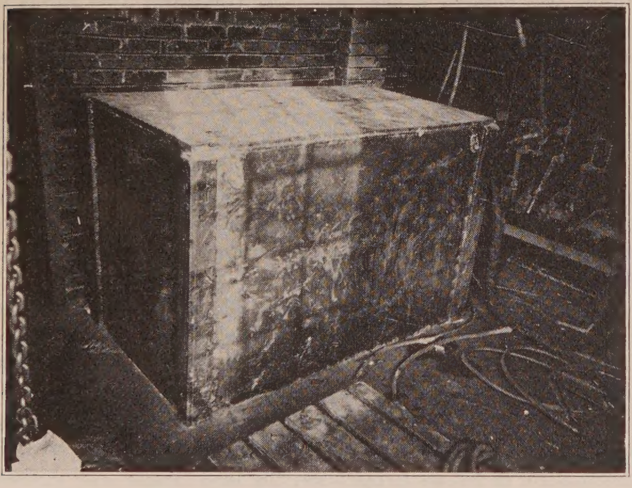


Figure 1

The motor tested was a 15 horsepower, 6 pole, 3 phase, 220 volt, 60 cycle type CS. Both bearing brackets were of the sealed-sleeve type. A twelve bladed blower, 21-inch diameter, was mounted on the shaft extension after the motor was assembled, to keep the cement dust in continuous circulation within the box.

The completely assembled motor was put in the box and securely bolted down, the motor leads were brought out through rubber-bushed holes at one end, six sacks of portland cement were emptied into the box, the lid was closed down and locked, and the motor started.

The test began June 12, 1926, and was concluded January 15, 1927, 214 days at an average of 12½ hours a day; a total of 2675 hours. During this time the box was opened but once; this occurred 2 months after the start as a check on the effectiveness of the blower, etc.

It was found the blower had kept the cement dust circulating with such force that the bottom of the box, immediately below the blower, had a hole worn through. The sides of the box, directly opposite the blower, were badly worn. The motor was covered with dust and the bearing housings were covered to such an extent that it was no longer possible to recognize their shape.

The hole in the bottom of the box and the worn places at the sides were repaired with sheet steel, the lid was again closed down and locked, the motor started, and the box was not again opened until the end of the test, 5 months later.

Test Results

At the end of the test, the motor was removed and taken apart. Figure 2 shows the motor before being removed from box. The blower had done its work well as may be judged from an examination of Figure 2, also Figures 3 and 4 showing the disassembled motor. There was not a place on the motor that was not heavily coated with cement dust. At the same time it was noted that there was no trace of oil leakage of any kind. The bearing caps, oil ring slot covers, and air shields, were removed and the bearings pressed out, examined and checked for wear. The surface of the bearings was stained a light chocolate color due to the sludging of the oil caused by the excessive heat developed in the box. The wear of the bearings was so slight that it could not be detected by checking with a plug gauge, and in fact, minute longitudinal scratches that were in the bearing at the beginning of the test were still visible.

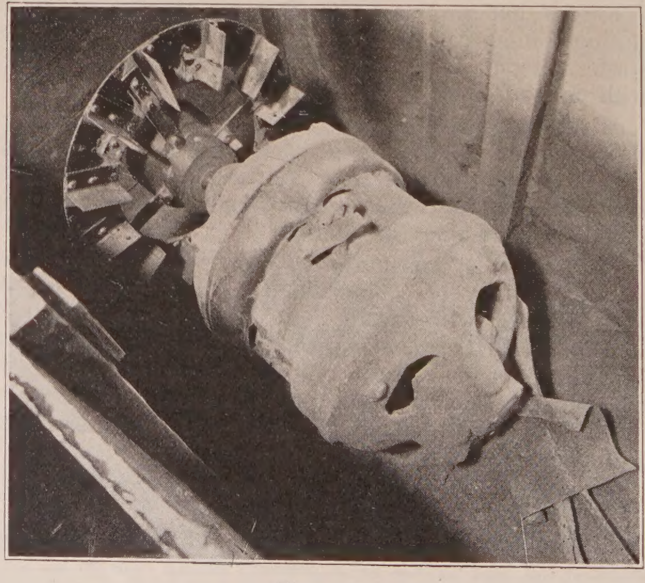


Figure 2

In spite of the excessive temperature developed in the sealed box and the relative high rate of oil evaporation resulting, there was still sufficient oil in the housings for satisfactory operation. The oil which, in spite of the severity of the test, was still of high lubricating value was removed from the bearings and strained. The amount of sediment was very small, as shown in Figures 5 and 6. Figure 5 shows the amount removed from the rear bearing and Figure 6 the amount from the front bearing. Greater heat, developed in the rear bearing on account of the weight of the blower, caused greater sludging of the oil than in the front bearing as indicated by the residue shown in Figure 5. These temperatures were of course quite abnormal.

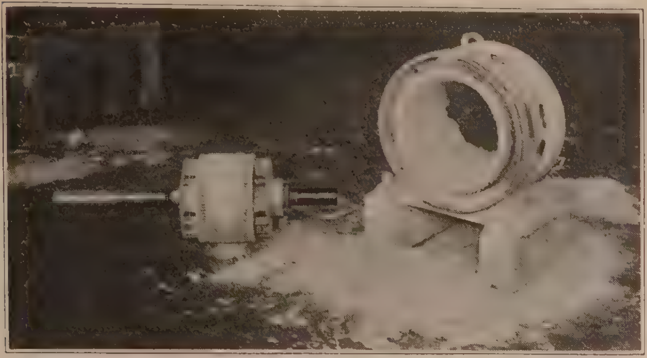


Figure 3

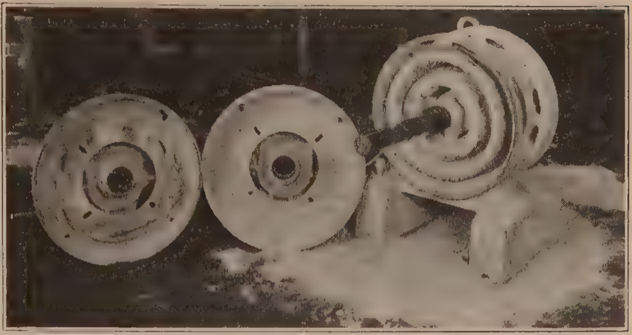
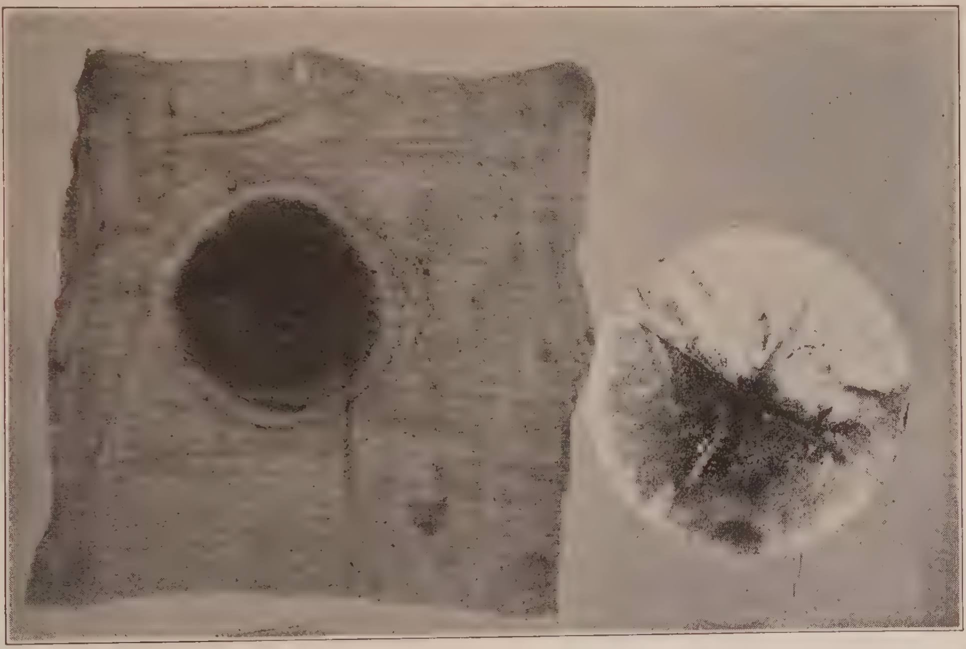


Figure 4

The results of this test proved conclusively that such bearings, even under very severe conditions, do not have to be oiled more than once or twice a year, that the bearing housing is oil tight and prevents leakage, and that the sealing features are very effective in excluding dust, dirt and grit, thereby prolonging the life of the bearing.



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Figures 5 and 6

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Large Increase in Quantity of California Cement Production

Cement, the most important single structural material in the mineral output of California, was produced in 1926 to the extent of 13,797,173 barrels, valued at $25,269,678, f.o.b. plant; being an increase of over half a million barrels in quantity over 1925, but only slightly in total value owing to a small drop in prices, according to information contained in the 1926 production report of minerals just compiled and released by the California state mining bureau. The 1925 output was 13,206,630 barrels, valued at $25,043,335, or an average of $1.90 per barrel. The 1926 average was $1.84 per barrel.

The 1926 production came from eleven operating plants in nine counties, employing a total of 3,047 men. The three plants in San Bernardino County made a total of 5,135,840 barrels, valued at $9,273,627, the balance of the state's product coming from a single plant in each of the following counties: Calaveras, Contra Costa, Kern, Riverside, San Benito, San Mateo, Santa Cruz and Solano. The new plant of the Calaveras Cement Company near San Andreas, Calaveras County, began operation and commercial shipments in 1926. Recent press notices record the consolidation of the Pacific Portland Cement Corporation, operating cement plants in San Mateo and Solano Counties, and a gypsum plant in Imperial County, with the Old Mission Portland Cement Company, operating at San Juan, San Benito County.

Cement Manufacturing in Dalmatia

A Description of the Cement Plants in Dalmatia—An Important Center of the Portland Cement Industry in Europe

By FEDERICI FEDERICO

A FAVORABLE combination of natural resources and transportation facilities has made the western coast of the Adriatic Sea one of Europe's important cement manufacturing centers. The coast here is a short, narrow terrace, scarcely raised above sea level at the foot of the Dinaric and Bebie Alps. All along the coast are numerous islands of all sizes. The coast in general is very rugged, reminding one of the Norwegian fiords. Geologically, the territory is in great part of Cretaceous and Eocene Eras.

Nearly in the center of Dalmatia, near the ancient Salona (the capital of the Province of Dalmatia at the time of the Roman Empire) important deposits of cement rocks were found about 1900. Analysis proved these to be of very good chemical composition for the manufacture of portland cement. A small plant was erected here in 1867. Other cement rock deposits were found at Almissa, where another small factory was erected.

The present large Dalmatian cement plants are now concentrated in the southern corner of Castella Bay (the ancient Sinus Salenitanus) because at this point the requirements for cement production and distribution are most fully met. Among the advantages of this location are: (1) there are flat areas of ground on the coast suitable for plant sites; (2) the raw material deposits are extensive and easily available; (3) the locality is protected from winds and the sea is always calm; (4) the water is deep enough even at the shore to float the largest steamers; (5) the Spalato-Sign-Sebenico and the Spalato-Zagreb railways serve the site and provide transportation facilities to the interior and to the harbor of Spalato.

The wharf of the Spalato Societa Anonima Cement Portland

Following are short descriptions of the Dalmatian cement plants arranged according to their ages.

The wharf and the Dietzch kilns of the Dalmatia Portland Cement Works, Ltd. This is the newest of the Dalmatian mills

The Prima Fabbrica Dalmata Cimento Portland Gilardi e Bettiza

This is a private corporation, with headquarters at Spalato, and was organized in 1867. The plant is located near the port of Spalato, but, as it never had its own wharf, cement for export had to be hauled by truck to the port.

The 120-meter wharf of the Dalmatia Portland Cement Works, Ltd.

The plant has three Dietzch kilns with four crucibles of small diameter. Production capacity can attain 44 barrels per crucible per day. Grinding is accomplished by two groups of tube mills. Storage facilities for fifteen hundred tons of cement are provided.

This is an old plant which supplies only the local requirements and ships a small amount of cement into Jugo-Slavia. It cannot compete with the other plants in the export trade.

Two Polysius, one Krupp and one Luther mills grind the clinker. The power plant consists of three 300 h.p. steam engines and two Diesel engines, one of 450 h.p. and the other 130 h.p.

Cement for export is loaded at the mill wharf. Barrels for packing cement are made at the plant.

The Spalato Societa Anonima Cemento Portland

The capital of this company is chiefly Italian and the general and sales offices are in Trieste. The mill and its quarries are located in the Jadro valley about 4500 meters from the sea. A narrow gauge electric railway connects the plant with the warehouses and wharves. The wharf is equipped with an electric crane bridge capable of loading 1000 tons of cement in 20 hours. Cement is shipped to India, China, Africa, and South America.

There are 62 crucibles of the Dietzch type in the mill, though usually only from 30 to 50 of them are in operation. They produce from 45 to 55 barrels of cement per crucible per day. Five Lohnert compound mills grind the clinker.

Two Allis-Chalmers rotary kilns are now being installed for burning natural cement.

Almissa Plant of M. Lavocat & Co.

At the time the plant just described was constructed a small mill was erected at Almissa. Almissa is a small town near the mouth of Cetina, about twenty kilometers south of Spalato. The plant is now the property of M. Lavocat & Company, of Neufchatel, France. This firm modernized the plant about two years ago.

At present there is a wharf that is not equipped with mechanical loading facilities. The coast here is open to winds and therefore loading is difficult and ships must seek shelter in the harbor at Spalato.

Another view of the Dalmatia Works wharf

The Societa Anonima Cemento Portland Dell' Adriatico

This is an Italian company with sales headquarters in Rome. The factory is located near the mouth of the Jadro.

Marl is transported from the nearby quarry by an aerial cableway. There are four groups of Dietzch kilns of four crucibles each. English gas coal (New Pelton) is used for burning.

The marl is placed in the kilns as it arrives from the quarry. Cement rock and clinker are handled by labor.

The quarries are near the mill and marl is brought to the kilns directly. There are four kilns equipped with Grueber automatic discharging grates. Each kiln produces from 165 to 270 barrels of cement per day. Ergo ball mills, manufactured by Amme, Gieseke and Konegan, grind the clinker.

Dalmatia Portland Cement Works Co., Ltd.

The newest and most modern cement plant in Dalmatia is that of the Dalmatia Portland Cement Works Co., Ltd. The company was incorporated in 1912. French capital first controlled the company, but control has now passed to Italian capital.

The mill is located on the peninsula of Castel San Giorgie, north of and about two kilometers from the plant of the Adria Portland. The quarry is 1800 meters from the mill and connected with it by an aerial cableway. The face of the quarry is 180 meters long and 60 meters high. Until recently compressed air was used for drilling, but last year a Keystone drill was installed and the American method of drilling and shooting tried. The result was satisfactory and that method will be used in the future.

Loading cement at the Dalmatia Works wharf. The latter is equipped with 3 electric cranes

Burning is accomplished in 32 Dietzch crucibles and in three new Candlot kilns with automatic charging and discharging equipment. Each crucible will produce about 70 barrels per day while each kiln will produce from 220 to 330 barrels per day. Gas coal is used in the crucibles while coke or anthracite is used in the automatic kilns.

Five Lohnert compound mills, having a combined capacity of 5500 barrels per day, grind the clinker.

Existing silos provide storage for 6000 tons of cement and new silos are now being built. The packing department is located in a large building on the wharf. Packing machines for bags are of the Libra type, while those for packing barrels are of the Lohnert type.

Ships are loaded at the company's wharf which is 120 meters long. It is equipped with three electric cranes which can load a maximum of 1800 tons of cement in twenty-four hours.

After the armistice, the U. S. Naval Command in the Adriatic Sea put into Castella Bay and the flagship "Olympia" and many destroyers often called at this wharf, which was, with its equipment, placed at the disposal of the U. S. Navy.

The composition of the raw materials in the quarry of the Dalmatia company are exceptionally uniform. The percentage of clay does not vary more than 0.5 per cent and the $CaCO_3$ not more than 1 per cent. Tests of the cement made over a range of years indicate the uniformity of the materials.

Laboratory	Date	CaO	SiO_2	Fe_2O_3+ Al_2O_3	MgO	Loss on Ignition
Gov. Test House	1916	62.40	21.65	10.10	1.95	1.53
London	1916	61.21	20.03	10.29	1.43	3.25
London	1923	63.30	19.95	9.74	0.79	3.39
Gov. Test House	1925	63.47	21.34	9.36	2.03	1.36

Conclusion

As the demand for cement increases throughout the world, the favorable location and the excellent raw materials at hand, assure the Dalmatian cement plants a bright future. The empirical methods of manufacturing cement which have for many years been used in Dalmatia are giving way to scientific control as is indicated by the well equipped laboratories of the Dalmatia Portland Cement Works.

Ratio of Cement Production to Capacity Shown in Department of Commerce Statistics

A new barometer of business conditions has been established by the Department of Commerce by including each month in the statistics of the cement industry a figure showing the ratio of production to total capacity.

The statement for the month of September establishes the total capacity of the cement industry, as of September 30, last, at 229,020,000 barrels. This capacity, established by rates of production sustained over continuous periods of three months by each of the plants, indicates a total capacity for the year 1926 of at least 215,300,000 barrels.

The August, 1927, output represented approximately 94.4 per cent of the capacity of the plants for that month and the production for the first eight months of the year was 75.2 per cent of the capacity available during that period. Corresponding figures for September and for the first nine months of the year are 92.2 per cent and 77.2 per cent respectively.

England's Largest Plant Remodeled

Concrete Clinker Storage, Silos, Coal Department Buildings, Coal Hoppers, Slurry Tanks, Elevator Casings and Hot Air Flues Are Part of Reconstruction Program at the Bevans Works of the Associated Portland Cement Manufacturers—Some of the Designs Used

REINFORCED concrete was used to a very large extent in a program of construction recently completed at the Bevans Works of the Associated Portland Cement Manufacturers at Northfleet, England. When the entire projected work is completed, this plant will lay claim to being Europe's largest cement plant.

Naturally the buildings, silos, washmills and other structures were built of reinforced concrete, but in addition to these, there were a number of unusual minor applications of this material in the building of elevator casings, hot air flues, etc. Also the designs used in these structures differ considerably from those commonly used in American cement mills.

Clinker Storage

One of the most interesting structures included in the program was the clinker storage, capable of storing 15,000 tons of clinker. An accompanying illustration shows the general design of this structure. It is 173 ft. by 81 ft. in plan and 47 ft. deep at its deepest point.

About three quarters of the total load is carried on the solid chalk or on some old brick walls 3 feet thick which formerly supported the drying floors. The spaces between these old walls have been filled. The slab comprising the hopper floor is 18 inches thick in places and spans the old drying floor walls.

The front portion of the hoppers is carried on a series of concrete columns. The hopper floor is of heavy beam and slab construction. The fact that there are 14 hopper shaped outlets in the floor necessitated a complicated floor design.

A peculiarity of the design is that when the hopper is filled till the clinker pile runs out at the toe of the slab, the front wall has no opposing wall to provide a reaction and the tie (see Fig. 2) that supports the wall has anchorage in the horizontal slab only. At first thought this may seem to be insufficient but as the clinker in the hopper is at equilibrium, all the pressure on the front wall above the slab level must be balanced by the friction of the clinker on the slab.

When the hopper is filled still farther, so as to reach the top of the existing wall, calculations show that the resulting thrust is opposed by the friction of the under side of the slab on the supporting foundations.

Another feature in the design of the hopper is the anchorage of the end walls. Because of surrounding equipment, it was impossible to have large buttress walls and the end walls were therefore designed as vertical beams tied together at the top and bottom. The consulting Engineer for the hopper was Dr. Oscar Faber and the con-

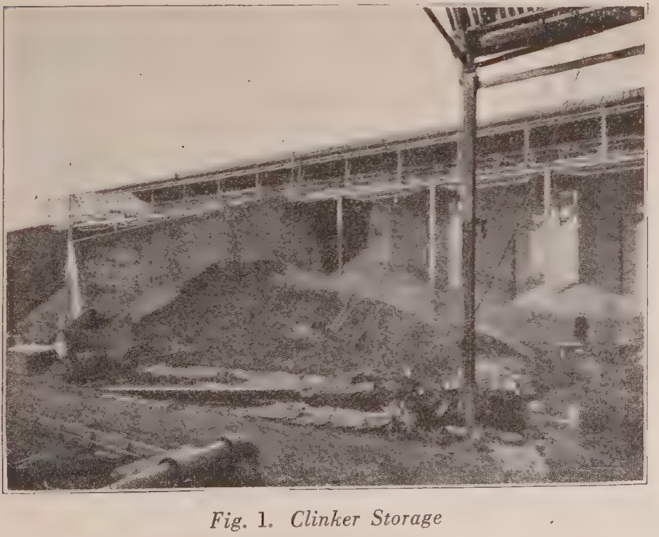


Fig. 1. Clinker Storage

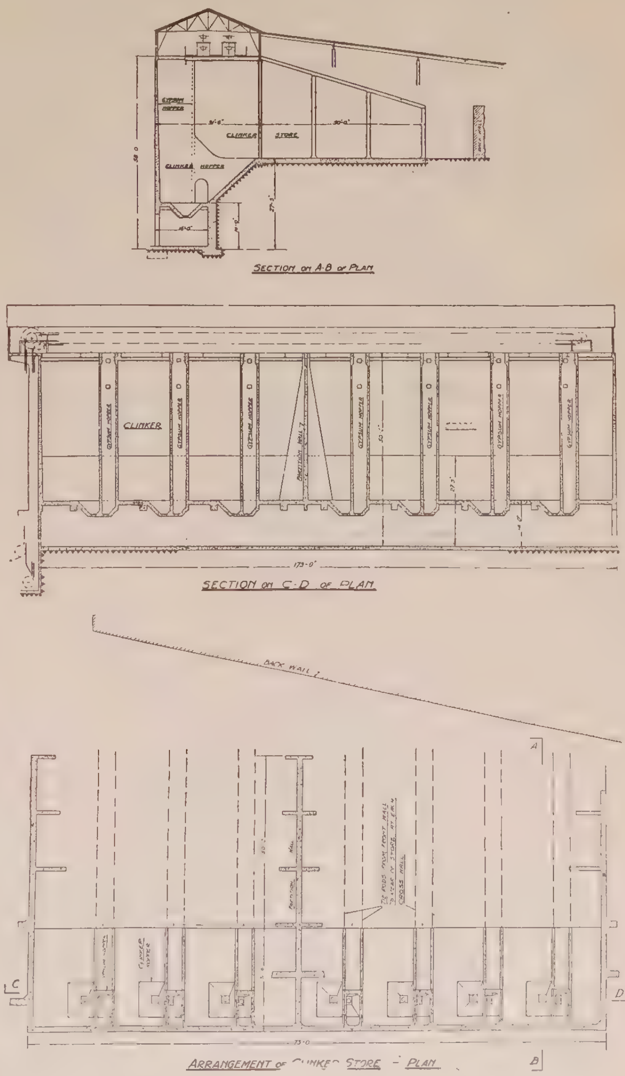


Fig. 2

From *Concrete and Constructional Engineering.*

struction was carried out by Mr. J. B. Lingham, of Northfleet, under the supervision of the company's engineer.

Storage Silos

Eight circular reinforced concrete silos, each of 2,000 tons capacity, comprise the cement storage facilities. Each silo is 32 feet in diameter and 84 feet high from ground level. Four of these are simply circular tanks above tunnel level. Each of the remaining 4 silos are subdivided into bins with a well and staircase in the center. This facilitates compliance with customers' requirements when special cement is asked for. Openings are arranged at each landing of the staircase so that samples for testing purposes may be taken from any bin and at any depth. (See Figs. 3 and 4.)

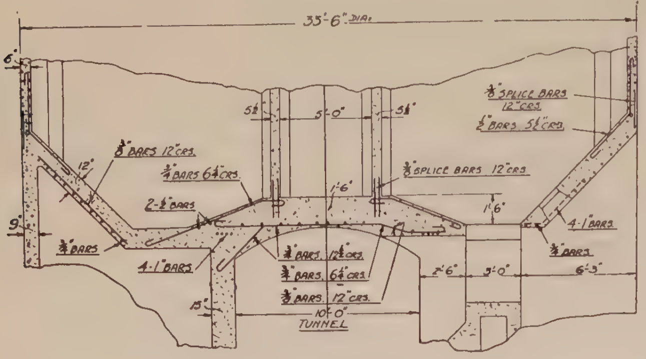
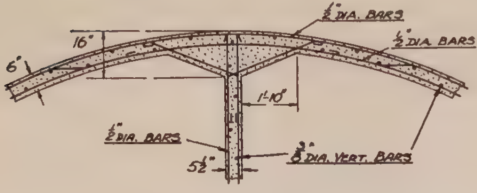
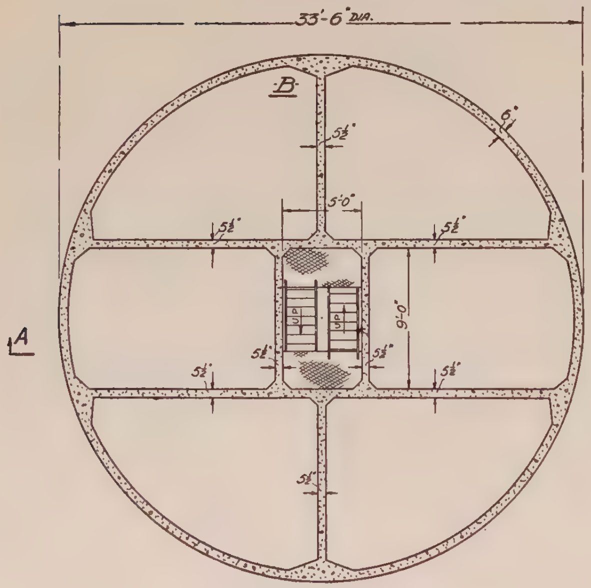


Fig. 3. Detail Over Tunnel



DETAIL AT -B-



SECTIONAL PLAN

Fig. 4. Cement Storage Silos

Slurry Tanks

The slurry tanks are of average design, except in size. They are 66 ft. diameter, with a capacity of 1500 tons.

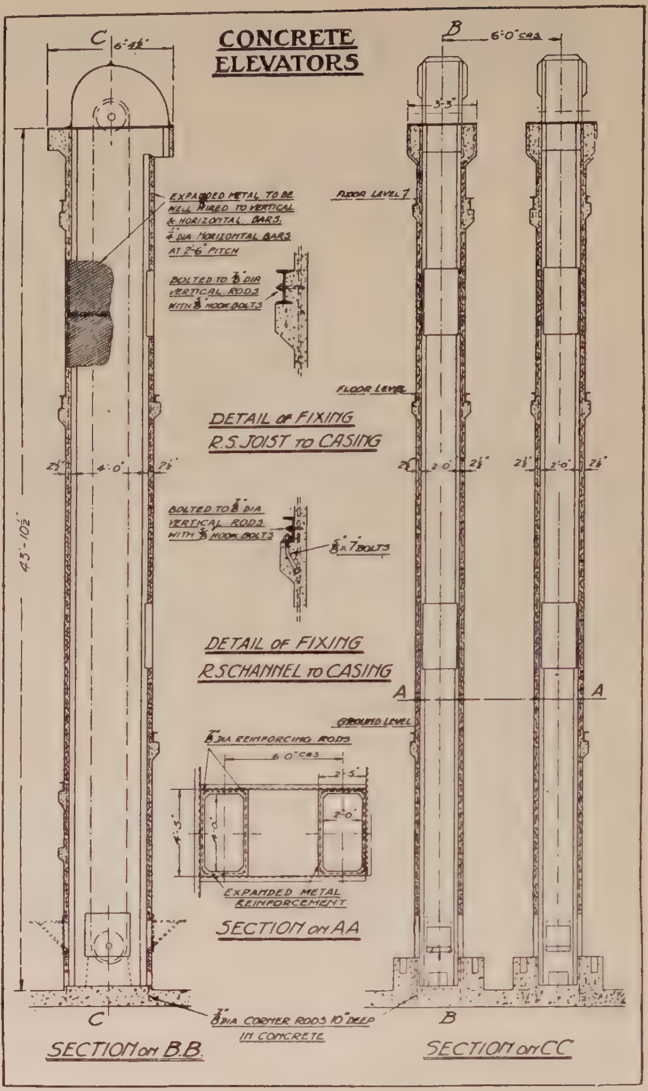

CONCRETE ELEVATORS
C
6'-4½"
B
6'-0" CRS.
3'-3"
EXPANDED METAL TO BE WELL WIRED TO VERTICAL & HORIZONTAL BARS.
¼" DIA HORIZONTAL BARS AT 2'-6" PITCH
FLOOR LEVEL
BOLTED TO ⅞" DIA VERTICAL RODS WITH ⅝" HOOK BOLTS
FLOOR LEVEL
DETAIL OF FIXING R.S. JOIST TO CASING
2½"
4'-0"
2½"
2½"
2'-0"
2½"
2½"
2'-0"
2½"
43'-10½"
BOLTED TO ⅞" DIA VERTICAL RODS WITH ⅝" HOOK BOLTS
⅝" x 7" BOLTS
DETAIL OF FIXING R.S. CHANNEL TO CASING
A
A
GROUND LEVEL
⅞" DIA REINFORCING RODS
6'-0" CRS
2'-5"
4'-5"
2'-0"
EXPANDED METAL REINFORCEMENT
SECTION ON AA
C
⅞" DIA CORNER RODS 10" DEEP IN CONCRETE
B
SECTION ON B.B.
SECTION ON CC

Fig. 5. Concrete Elevator Casings

Coal Department

The coal building is built entirely of reinforced concrete and measures 65 ft. by 41 ft. by 32 ft. The construction consists principally of 18- by 18-inch piers reduced to 18 by 12 inches at the top and spaced at about 12 ft. 6 in. centers. In the intervening space are reinforced concrete walls 6 inches thick.

A 60-ton reinforced concrete coal hopper supplies coal to the grinding mills. The hopper is 58 ft. long by 9 ft. wide and is provided with six outlets, one for each grinding mill.

To facilitate cleaning the hoppers when in use, a partition divides the hopper into two parts. Two parallel rows of 12-in. square reinforced concrete columns support the hopper at about 12 ft. above floor level. Lateral stiffening is provided by the top deck which runs from one end of the building to the other.

Elevator Casings

Reinforced concrete casings have been substituted for those of steel used in the past and which experience has shown last not more than two or three years. The casings are in some cases 60 feet high, of concrete 2½-inches thick, reinforced with expanded metal and with one ⅞-in. rod in each corner. Cast iron door frames are built at suitable points to give access to the mechanical equipment. (See Fig. 5.)

(Concluded on page 112)

EDITORIALS

Cement Imports Again

THE government figures for September, just recently made available, show for the first time in many months a very definite increase in the amount of portland cement imported, both as compared to the previous month, and as compared to the same month of the previous year. Whether we like it or not, the only logical inference that can be drawn from this fact is that the question of foreign cement in the American market is not yet satisfactorily answered so far as American cement manufacturers are concerned.

Much discussion and propaganda, combined with some price adjustments, have enabled American manufacturers to combat foreign cements with fair success until very recently. The average price reported for the foreign cement imported during September is extremely low, however—$1.27 per barrel—and this fact probably goes far to explain the increase in amount of cement brought in. It further shows what an impossibly low bogey American manufacturers have to shoot at if they expect to compete with foreign cements on a price basis. And while patriotism and sentiment may offset a small price differential, they cannot be reasonably expected to offset the wide margin indicated by the present figure.

In other words, the condition which we predicted several months ago is becoming a reality. And we believe that the remedy which we proposed then is now more than ever essential if a final answer is to be provided to the problem of foreign cement imports.

Cement manufacturers, as individuals, may or may not believe in the economic soundness of a protective tariff, but regardless of personal opinion regarding the matter, the protective tariff is with us as part of our present economic machinery, and relations between various industries within our country are affected by the workings of such a tariff. While such conditions exist the cement industry is quite as much entitled to its share of protection as is any other industry within the country, and there is no particular reason that we can see why cement manufacturers should not present their claims at the next session of Congress just as strenuously as have other industries whose prosperity has been affected by the competition of foreign manufacturers.

Under the present economic system the vicious circle created by the importation of foreign cements cannot be combated successfully in any other way than by prohibitive tariff, and the sooner American manufacturers realize this and bend their efforts to the securing of such protection, the sooner will the problem be solved. Inland manufacturers should be no less vigorous in the support of such a policy than coastal manufacturers who are already feeling the pinch of foreign competition, for if the present situation goes on it is only a matter of time until the manufacturers supplying the mid-western market will be affected by the coastal situation quite as unpleasantly as are the coastal manufacturers themselves.

There's an old trite suggestion now in order—write your congressman. Or better still, have a good old fashioned heart-to-heart talk with him before the coming session gets too far under way. It's an important thing to do, even though you aren't yet among those who have lost business to foreign manufacturers.

Trophies

TROPHIES alone do not accomplish such beneficial results as have resulted in the accident prevention work in the cement industry. Such records as have been made are chiefly due to hard work and constant reminders of the need of caution.

But the award of trophies for safety records is a valuable incentive to greater efforts in reducing accidents. It is one method of keeping the idea of safety before the workers. Man is so constituted by nature that he wants to excel his fellow man. A trophy brings this quality to the fore with beneficial results.

Within the industry itself there are interplant trophies for award in competitions between the various plants of an operating company, trophies to be awarded to the department in a plant having the best safety record and the much sought after trophies of the Portland Cement Association awarded for a year's run without a lost time accident.

In addition there is the "Sentinels of Safety" trophy awarded by the "Explosives Engineer" through the co-operation of the U. S. Bureau of Mines. When related industries interest themselves in the safety of the men using their products, though these men are employed elsewhere, such as the award of the "Sentinels of Safety" trophy, another step has been taken toward safer operation in the industry.

Any individual or organization that does a particularly good job along any one line thereby incurs a moral responsibility to other, less fortunate individuals or industries. In its manufacturing branch, the cement industry has reached that point where it can help other related industries. The construction industry has just recently concentrated on safety work. Would it not be a fine thing for the cement industry, with its background and experience in safety work, to join with the constructors and place that experience at the service of its sister industry? By so doing it will be rendering a definite service and at the same time it will gain the lasting good will of that industry that uses the product it manufactures.

Cement Statistics for October

OCTOBER, 1927, production and shipments of portland cement show the usual seasonal decline from the summer peak but were greater than for any preceding October and 3 per cent higher than a year ago, according to the Bureau of Mines, Department of Commerce.

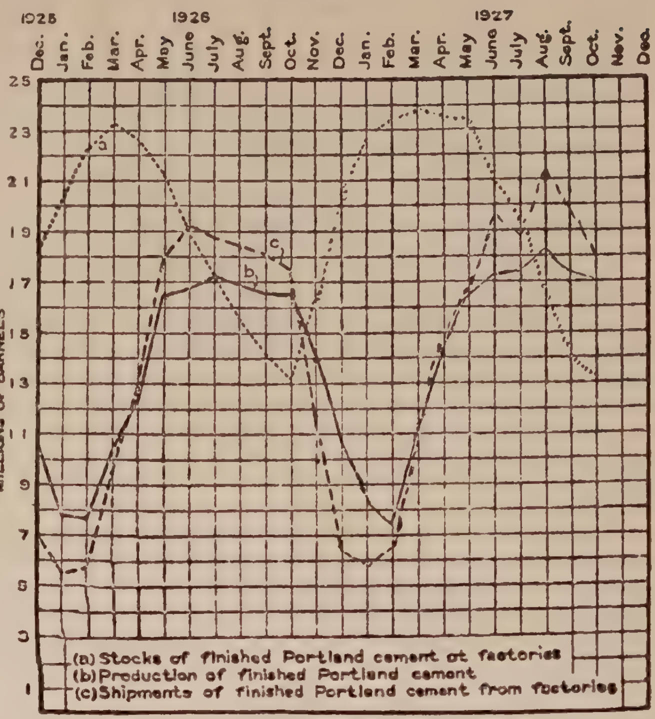
The output of three new plants, located respectively in Florida, Texas, and West Virginia, is included in these statistics, which are compiled from reports for October, 1927, received direct from all manufacturing plants except two, for which estimates are necessary on account of lack of returns.

Estimated Clinker (Unground Cement) at the Mills at End of Each Month, 1926 and 1927

(Figures Represent Barrels)

Month	1926	1927
January	9,074,000	9,989,000
February	10,931,000	11,943,000
March	12,290,000	12,997,000
April	12,967,000	13,335,000
May	11,695,000	12,514,000
June	10,144,000	10,926,000
July	8,604,000	9,609,000
August	7,362,000	7,887,000
September	6,112,000	*6,490,000
October	5,370,000	5,960,000
November	5,748,000	
December	7,799,000	

*Revised.



Production, Shipments, and Stocks of Finished Portland Cement, by Months and by Districts, in Barrels

Month	Production		Shipments		Stocks at end of month	
	1926	1927	1926	1927	1926	1927
January	7,887,000	8,258,000	5,674,000	5,968,000	20,582,000	22,914,000
February	7,731,000	7,377,000	5,820,000	6,731,000	22,385,000	23,560,000
March	10,390,000	11,452,000	9,539,000	11,083,000	23,236,000	23,922,000
First quarter	26,008,000	27,087,000	21,033,000	23,782,000		
April	12,440,000	14,048,000	12,965,000	14,350,000	22,710,000	23,654,000
May	16,510,000	16,701,000	17,973,000	16,865,000	21,255,000	23,503,000
June	16,866,000	17,224,000	19,134,000	19,761,000	19,000,000	20,972,000
Second quarter	45,816,000	47,973,000	50,072,000	50,976,000		
July	17,134,000	17,408,000	18,812,000	18,984,000	17,301,000	19,397,000
August	16,995,000	18,315,000	18,583,000	21,411,000	15,718,000	16,292,000
September	16,571,000	*17,505,000	18,087,000	19,828,000	14,188,000	*13,996,000
Third quarter	50,700,000	*53,228,000	55,482,000	60,223,000		
October	16,596,000	17,174,000	17,486,000	18,028,000	13,334,000	13,143,000
November	14,193,000		11,276,000		16,243,000	
December	*10,757,000		6,432,000		20,679,000	
Fourth quarter	*41,546,000		35,194,000			
	*164,070,000		161,781,000			

*Revised.

Commercial District	Production—October		Shipments—October		Stocks at end of October		Stocks at end of Sept., 1927*
	1926	1927	1926	1927	1926	1927	
Eastern Pennsylvania, New Jersey, Md.	3,986,000	3,799,000	4,272,000	3,924,000	2,437,000	3,369,000	3,494,000
New York	999,000	1,143,000	921,000	1,171,000	685,000	1,142,000	1,170,000
Ohio, Western Penn., and West Virginia	1,795,000	1,746,000	1,668,000	1,964,000	2,062,000	1,516,000	1,735,000
Michigan	1,338,000	1,557,000	1,385,000	1,560,000	1,025,000	1,077,000	1,080,000
Wisconsin, Illinois, Indiana, and Kentucky	2,160,000	2,280,000	2,656,000	2,579,000	1,296,000	840,000	1,139,000
Virginia, Tenn., Ala., Ga., Fla.,† La.‡	1,430,000	1,567,000	1,391,000	1,505,000	1,067,000	1,188,000	1,126,000
Eastern Missouri, Iowa, Minn., and So. Dak.	1,458,000	1,572,000	1,842,000	1,811,000	1,609,000	966,000	1,204,000
Western Missouri, Nebraska, Kan., Okla.	1,032,000	1,109,000	984,000	1,208,000	1,455,000	1,215,000	1,314,000
Texas	428,000	532,000	444,000	535,000	406,000	270,000	272,000
Colorado, Montana, and Utah	275,000	187,000	252,000	258,000	406,000	313,000	384,000
California	1,381,000	1,388,000	1,359,000	1,191,000	480,000	901,000	704,000
Oregon and Washington	314,000	294,000	312,000	322,000	406,000	346,000	374,000
	16,596,000	17,174,000	17,486,000	18,028,000	13,334,000	13,143,000	13,996,000

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*Revised. †Began producing September, 1927. ‡Began producing June, 1927, and shipping July, 1927.

MEN and MILLS

Notes from the Field

Davenport Cement Company, Inactive for Time, Plans Mill Near Buffalo, Iowa

The Davenport Cement Company, Davenport, Iowa, is planning to begin work next spring on a plant costing $1,500,000, east of Buffalo, Iowa, according to an announcement by Joe R. Lane, president of the concern. Buffalo is 10 miles south of Davenport.

The mills will be erected on a 300-acre tract acquired seven years ago by the company, with a capacity of 1,500 barrels daily. Financing arrangements have been completed.

The site was chosen because of its water frontage, proximity to railroads and favorable condition of the soil.

The firm has an authorized capital of $6,000,000, including $3,000,000 in preferred stock and $3,000,000 in common stock. William L. Mueller is vice president and Charles Shuler is treasurer.

Low Is New Vice-President of Monolith

The Monolith Portland Cement Company, Los Angeles, California, has recently promoted three executives to higher positions. Carroll A. Low, former director of sales, and then assistant general manager, has been appointed vice-president and general manager. Mr. Low fills the vacancy created by the retirement of Wilmar Evans. T. R. Larson, who was traffic manager and assistant sales manager, has been made director of sales, and F. R. Brownell, for more than four years a special plastic representative for Monolith, fills Mr. Larson's former position.

Mr. Low has been connected with the industry for over twenty years, having filled executive positions with a number of firms in various sections of the West. Mr. Low has been with Monolith since 1920.

Mr. Larson began his career in the cement industry, and joined the Monolith organization at its beginning.

Before going to the coast, Mr. Brownell spent several years in the Rocky Mountain region.

Begin Reconstruction of Plaster City Plant

A crew of fifty men, under the direction of Superintendent C. G. Townsend, has began work on the reconstruction of the Plaster City gypsum plant of the Pacific Portland Cement Company. Fire destroyed the original buildings early last summer.

The new plant will have a daily capacity of 300 tons, 75 tons more than that of the old plant. The new building is to be built of steel and concrete and ready for operation January 15.

Alonzo G. Kinyon of Fuller-Kinyon Dies at Johns Hopkins Hospital

Alonzo G. Kinyon, well known as an inventor, died Sunday, November 13th, at the Johns Hopkins Hospital, at Baltimore, Maryland. Shock following an operation for tumor of the brain earlier in the week was the cause.

For many years he had been associated in the development of machinery and apparatus in the pulverized coal and cement field. As the result of painstaking efforts he was on November 11, 1926, awarded the Edward Longstreth medal of honor by the Franklin Institute, Philadelphia, as well as a life membership in the institute. This honor came to him in recognition of his invention and development of the Fuller-Kinyon conveying system.

Beside his affiliation with the Franklin Institute, Mr. Kinyon was a member of the Golfers' Society of America, Traveling Engineers, American Society of Mechanical Engineers, Saucon Valley and Lehigh Country Clubs.

Mr. Kinyon was born in Amboy, Ill., July 12, 1870. His father built the Chicago, Burlington and Quincy Railroad, and was of an inventive turn of mind. At the age of 17 Mr. Kinyon started to work on his father's railroad as newsboy. He advanced step by step through every branch of railway transportation. In spite of possibilities awaiting him in this field, invention appealed to him so greatly he decided to make that his life work. Shortly before going to Allentown, Pennsylvania, Mr. Kinyon was fuel engineer on the Seaboard Air Line. About nine years ago Mr. Kinyon joined the Fuller-Lehigh Company where, until his death, he held the position of consulting engineer.

Lehigh May Increase Capital Stock to $60,000,000

The Lehigh Portland Cement Company has called a special meeting of stockholders for December 16th to vote on a proposed increase of capital stock from $30,000,000 to $60,000,000. The authorized common share capitalization of $30,000,000 of $50 par stock will not be changed, but a new 7 per cent cumulative preferred stock consisting of 300,000 shares of $100 par value stock will be authorized.

Should this plan be adopted the authorized capital stock will be evenly divided between common and preferred stock. There is now $22,517,400 outstanding common stock.

One report suggests that in doubling its capitalization, a liberal distribution to common stockholders is looked for. It is believed that the new shares will be used for a stock dividend, allowing the controlling interests of the company to dispose of part of their common holdings without sacrificing control.

Peerless Plant at Union City Closes for Winter; No Repairs Being Made

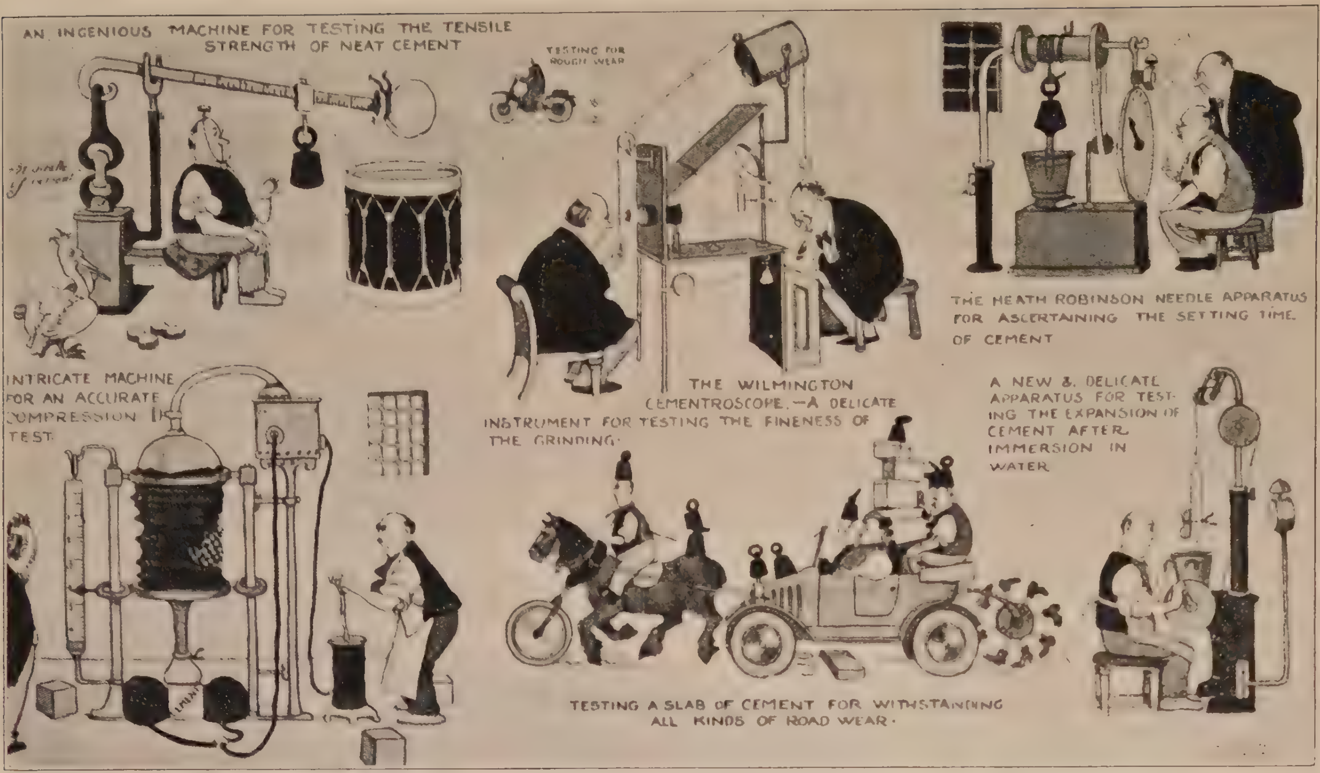
The Union City, Michigan, plant of the Peerless Portland Cement Company, closed down the week of October 31st. Some doubt exists as to whether the plant will reopen in the spring. No labor was retained for making annual winter repairs and as a result there is much speculation regarding the company's plans. No authoritative statements have been issued.

Canada Issues $20,000,000 in Bonds as First Step in Reorganization

One of the first steps in financing the new Canada Cement Company, Ltd., was taken on October 25th when $20,000,000 in first mortgage sinking fund 5½ per cent bonds, due in 1947, were offered to the public. The bonds are priced at 99 and interest, to yield about 5.58 per cent.

The sale of $21,000,000 of 6½ preference shares will soon be launched. The company's common stock issue is 600,000 shares.

Details of the sale and names of executives and board personnel were announced in these pages in the November issue of CONCRETE


AN INGENIOUS MACHINE FOR TESTING THE TENSILE STRENGTH OF NEAT CEMENT
TESTING FOR ROUGH WEAR
THE HEATH ROBINSON NEEDLE APPARATUS FOR ASCERTAINING THE SETTING TIME OF CEMENT
INTRICATE MACHINE FOR AN ACCURATE COMPRESSION TEST
THE WILMINGTON CEMENTROSCOPE.—A DELICATE INSTRUMENT FOR TESTING THE FINENESS OF THE GRINDING
A NEW & DELICATE APPARATUS FOR TESTING THE EXPANSION OF CEMENT AFTER IMMERSION IN WATER
TESTING A SLAB OF CEMENT FOR WITHSTANDING ALL KINDS OF ROAD WEAR

One of the most serious and important angles of cement manufacture—laboratory tests made for fineness, compression and tensile strengths, with very delicate equipment.

As shown, a most intricate type of test for determining the wearing quality of concrete roads has been devised. Highly sensitive needle apparatus is used for ascertaining the setting time of cement, and great skill is required in determining the expansion of cement after immersion

G. & T. Earle, Limited, use this means in their advertisements of maintaining interest in cement among readers of British journals

Figures Show Texas Production and Sale Increases

A compilation of figures by the bureau of economic geology at the University of Texas, in co-operation with the United States bureau of mines shows that six cement plants located in San Antonio, El Paso, Dallas, Houston and Fort Worth produced 5,007,374 barrels during 1926 and sold 5,024,359 barrels, thus reducing the stock carried over from the previous year.

The average per barrel sale value was $1.89. Both production and sale are reported to have increased materially last year over 1925.

Cement City, Michigan, Offices Removed to Jackson

The Cement City offices of the Consolidated Cement Corporation, a Cowham subsidiary, have been removed to the Carter Building, Jackson, Michigan.

International Superintendent Moves to Plant Town

Mr. E. Struckman, general superintendent of the International Cement Corporation, has taken up his abode at Greencastle, Indiana, for the balance of the winter.

Meeting of Portland Cement Association at Chicago

Committee meetings opened the program of the twenty-fifth anniversary gathering of the Portland Cement Association on Monday, November 14th, at the Blackstone Hotel, Chicago. The Board of Directors also met on the first day. General sessions began Tuesday, November 15th, with discussions of technical problems and mill practice. At this session were also presented a paper by M. A. Hyde on "Factors in the Choice of Waste Heat or Public Utility Power for Cement Plants," and a symposium on raw mix control.

The anniversary dinner was held on Wednesday evening, November 16th.

The following are the officers and directors who were elected: President, G. S. Brown, president, Alpha Portland Cement Company, Easton, Pa.; first vice-president, E. M. Young, president of Lehigh, at Allentown; second vice-president, Robert B. Henderson, Pacific Portland Cement Company, at San Francisco; treasurer, John L. Senior, president of Consolidated Corporation, Florida and Signal Mountain.

New directors are H. L. Block, president of Missouri; W. S. Speed, president of Louisville; H. S. Wherrett, vice-president of Pittsburgh Plate Glass Company; Chas. Conn, president of Giant Portland; C. B. Condon, secretary of Hawkeye Portland, and John L. Miller, president of Penn-Dixie.

Mathieson Cement Plant to Cost $1,150,000

Further reports regarding the new cement plant to be built by the Mathieson Alkali Works, New York City, mention that the cost of the new plant will be in excess of $1,150,000, including machinery and that it is to be completed some time in 1928.

This plant will adjoin the soda ash, caustic soda and affiliated works of the company at Saltville, Virginia.

"Carl D. Bradley" Sets New Mark in Shipping

Breaking all records in fresh-water shipping, the "Carl D. Bradley," Great Lakes steamer, in October is reported to have conveyed 15,724 tons of limestone to the new Buffington Harbor from Calcite, Michigan. Her own automatic unloading machine discharged the raw material in five hours, which, it is said, broke another record.

Old Mission Departments Shut Down

The Old Mission branch of the Pacific Portland Cement Company, at San Juan, California, on October 31st, closed down for a short time its raw grinding and burning departments, apparently to reduce surplus stock. All other departments continued to function.

Unskilled Labor an Obstacle, Canadian Declares

The October issue of "Municipal Improvements," a small magazine published by the Canada Cement Company, Ltd., bears on its cover an illustration, in colors, of the Port Colborne plant safety trophy amid its surroundings. The leading article, "Eliminating the Blood Cost of Industry," by W. G. H. Cam, power and safety engineer of the company, is written around "this monument to the living."

The article reads in part, "The Canada Cement Company's cost of compensation for accidents has dropped to 7 per cent of the figure at which it stood in 1921. But that fact is a triviality compared with the increase in manhour efficiency that has gone hand in hand with the decrease in casualties. . . . Security is the key word of the charter of human liberty. Industry's ideal is security in the continuity (and expansion) of her products, in the performance of her machinery, in the supply of her motive power, and last but not least in the quality and performance of the men who are directly responsible for the production and distribution of her wares. So industry has a common interest with the worker in his health, wealth and security of body and mind, for these things conduce to the security of industry.

"To the modern industrialist, 'unskilled labor' is an obstacle, and labor turnover a hazard, both indicating the direction in which further mechanization of his process is desirable if manufacturing cost is to be reduced to its lowest terms and stabilized. He does not hire labor; he employs men.

"Times are changing; the public can no longer point with horror at the frequency and severity of industrial accidents. Industry now leads the way in setting an enhanced valuation on human life.

"The widespread application of machinery to industry led industrialists into the cardinal error of regarding men from the purely mechanical point of view as an adjunct to the machine.

"Experience has shown that man's behavior in emergency is always individual and never typical, and a man's potentialities can be assessed only by actual trial. So an intimate knowledge of the men in his charge is the first requisite of good foremanship, and the successful operating executive will be the man who keeps in close personal touch with his superintendents and their foremen and studies their characteristics, their relations with their subordinates, and their behavior in emergency.

"Good housekeeping, man-hour efficiency, accident immunity, and company loyalty are all fruits of the same industrial tree, and the fertilizer is fair play and full recognition of the value of each worker as an individual, and as a working partner in the enterprise."

Maine Plant of Lawrence Company to Open in February

The plant of the Lawrence Portland Cement Company at Thomaston, Maine, is now more than half completed. The first kiln will be fired some time in February.

The office building, lime-burning building, cement storage plant, machine shop, coal crushing and storage plant are practically completed.

Except for a few paper mills in Maine, the new project will be the largest single consumer of electric power in the state and to cope with its needs, the Central Maine Power Company is erecting a special 60-mile transmission line.

An adequate water supply will be assured by a 300,000 gallon reservoir of cement, which will also be available in case of a fire in Thomaston. There are sixteen feet of water at low tide along the riverfront wharves in Thomaston, while Rockland, with an excellent harbor, is four miles distant. The Rockland branch of the Maine Central Railroad joins the two places.

The company holds 53 separate parcels of land. Between Thomaston and Rockland the holdings total 900 acres, with an additional twenty acres on the Rockland waterfront.

While the Lawrence company's plant is said to be New England's only one, the region possesses one of the richest limerock deposits in the country. The territory had been, until a number of years ago, a lime-producing center, dating back to the end of the 18th century. Along the shores of St. George's river are a score or more of abandoned kilns of the masonry type. At one end of Thomaston is still a small independent company producing lime.

Social Meeting of Lawrence Employes Hears Russell Frame

At the semi-annual meeting of Lawrence Portland Cement Company employes, held November 1st in the social rooms of the company at Northampton, the address of the evening was delivered by Russell Frame, who heads the safety work of the Alpha Portland Cement Company. Mr. Frame spoke on the value of safety work, giving instances which had come to his attention, and told how employes may co-operate to prevent accidents. A second safety talk was made by W. S. Ackerman, Jr., superintendent of the plant.

A social hour, with music and refreshments, followed.

Lawrence Man Located in Maine

Chas. Zimmerman, of the Lawrence Portland Cement Company and formerly with Atlas, is now located in Rockland, Maine.

Growth of Monolith Is Shown in Assets

The Monolith Portland Cement Company, with mill at Monolith, California, and head office at Los Angeles, reports a satisfactory increase in business in 1927 as compared with 1926.

The company's assets and net worth, after allowing for depreciation, have shown a continual growth from October, 1921. shortly after the corporation was formed under Nevada laws, to 1924. Since that year assets have remained stationary.

The growth in assets and net worth is as follows: Assets, 1921, $1,792,317; 1922, $2,680,365; 1924, $3,836,232; January 1, 1926, $3,733,690. Net worth, 1921, $1,217,597; 1922, $2,462,031; 1924, $3,281,964.

Current position of the concern on the last publication of balance sheet, January 1, 1926, was in the ratio of about 2.5 to 1.

The company is capitalized at $3,000,000, of which $1,500,000 is 8 per cent cumulative preferred and $1,500,000 common, both of $10 par value. The preferred is preferred both as to earnings and assets in case of liquidation and carries no voting power.

U. S. Trusts Urged by Dr. Bruno Bruhn

Dr. Bruno Bruhn, of Essen, Germany, and the vice-president of the Polysius Corporation and a former managing director of the Krupp steel works, was one of the foreign executives who attended the 25th annual convention of the Portland Cement Association, at the Blackstone Hotel, Chicago, on November 14th to 16th. The daily press credits him with the following statement:

"I strongly advocate a thorough understanding between England, France and Germany, and, if possible, Italy, as a guaranty for peace. I hope the time may not be far away when American laws will allow the formation of trusts. Such organizations have been most beneficial in Germany's experience and they may be instrumental in obtaining economic peace between the key industries of the old and new countries."

Texas Adopts New Cement Tariff

Rates for practically all distances will be materially reduced by a new cement tariff which will become effective in Texas on December 12th. It almost duplicates the interstate tariff to become effective on December 12th under orders of the Interstate Commerce Commission.

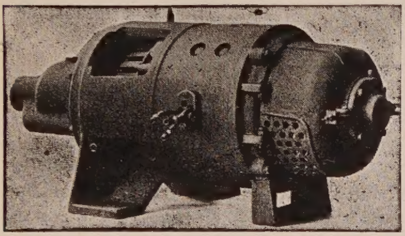
Adoption of the interstate scale was urged at the meeting of the commission early in November. It is claimed that discrimination in favor of Ada and other Oklahoma points shipping cement into Texas will thus be ended.

Mill Equipment

Westinghouse Builds New 3-KW Turbine Generator Unit

A direct-connected turbine generator unit having a rating of 3 KW is now being turned out by the South Philadelphia works of the Westinghouse Electric and Manufacturing Company. This apparatus has been developed for use with steam shovels and general outdoor construction work.

The unit is capable of generating 3 KW at 125 volts direct current when operating under steam conditions commonly encountered in its projected field of application. The Westinghouse re-entry type single impulse wheel turbine is used and is overhung on the end of the generator shaft.



The steam nozzle and reversing chamber are contained in a single block which is bolted to the inside of the turbine cylinder. The speed of the unit is regulated by a flyball, centrifugal, shaft type governor, which is carried in a heavy case bolted directly to the rotor disc. This governor is equipped with specially hardened steel knife edges and blocks and acts directly on the valve stem, thus eliminating all levers. This governor has been employed for many years by the Westinghouse company on their units of various capacities and has given satisfaction under the most exacting conditions of service. A very effective sealing gland is furnished to prevent the escape of steam around the rotor shaft where it passes through the cylinder.

The unit runs on two heavy single row ball bearings, each bearing being held securely to the shaft by a lock nut. Grease is used for lubrication and can be added by removing a pipe plug located over each bearing. The manufacturers state no oil should be used in these bearings as it may leak through and deteriorate the windings.

All parts are readily accessible for inspection by simply removing the turbine and the generator end covers. No expert attendance is required for its operation and maintenance as there are no delicate adjustments to make and the unit requires practically no attention while in operation. The manufacturers have incorporated in this unit insurance against destruction of the machine and injury to the operators in case of accidental overspeeding, by providing protection in the form of an overhanging flange of the turbine rotor. This flange is subject to expansion when the unit reaches a predetermined speed, this speed being well below the expansion when the unit reaches a predetermined speed. This speed is also well below the rupturing point of any of the parts. If this speed is exceeded the expanded rotor flange fills the clearance space in the cylinder thus establishing a rubbing contact. This contact sets up a powerful breaking action which restrains the speed of the unit to within safe limits.

Peerless Solves Difficult Dust Problem

The Peerless Portland Cement Company is situated within the city of Detroit, and for some time was faced with a serious dust-problem. The matter was complicated by the dampness of the air caused by the moisture and steam thrown off from water-jets cooling material in the grinders.

In view of the fact that various attempts had already been made at different times to overcome the dust-difficulty, the contract for the new dust-collecting equipment, which was awarded to Northern Blower Co., Cleveland, Ohio, contained very stringent conditions. It was specified that the system must be erected and operated at the manufacturer's risk until it had definitely fulfilled the requirements to the satisfaction of the management.

An eight-unit Norblo continuous suction air filter was specially designed as the collector. This type consists of a series of separate filter units in which the air is cleaned by being drawn through cloth filter bags, each unit being kept in good filtering order by periodical reversals of the air current at intervals of a few seconds apart. This system is, of course, capable of continuous operation—in fact, it is even practicable to shut down one or more of the units for repairs or inspection without interfering with the filtering action of the others. The pipework also necessitated special design to avoid the risk of the damp dust piling up and clogging in the pipes.

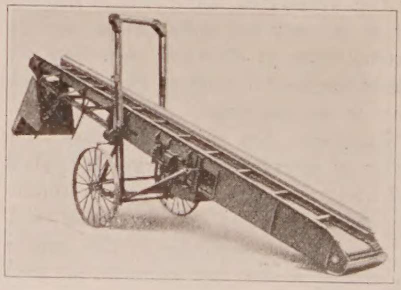
"Drag-On" Is New Jeffrey Scraper Conveyor

"Drag-On" is the name of the new Jeffrey portable scraper conveyor for handling coal and coke. Its principal points of difference from previous models of Jeffrey portable scrapers are the reduced weight of the frame, the increased size and strength of the conveying chain and the larger screening chute.

The new twenty-five-foot Jeffrey Drag-On is eleven hundred pounds lighter than its predecessors. Although the frame is lighter, the working and wearing parts of the "Drag-On" are actually stronger. The conveying chain, for example, is the combination type Jeffrey 188 Hercules. The flights, of quarter-inch steel plates, are L-shaped and run the full width of the trough. The bottom plates of the loading end of the trough are also of quarter-inch steel; these plates have been made extra heavy to stand the pounding of the coal in the loading pit.

The screening chute is three feet long and gives six square feet of mesh for taking the fines out of the coal while loading. This mesh is welded from round bars arranged so that the coal meets no resistance in sliding over it.

New wheels on the "Drag-On" also help to increase its mobility. These wheels are four feet in diameter, on three-inch tires, swiveled to turn in either direction. Thus the "Drag-On" describes a complete circle around a fixed loading point. The wheels are bronze-bushed and pressure greased.



Power is supplied by an electric motor running on either ball or roller bearings as desired. For raising or lowering the discharge end, an easily handled worm-geared winch pulls a cable over the top of a short, rigid mast. This winch is high pressure lubricated, as is every other transmission part. The grease gun for this lubrication comes with the "Drag-On" as standard equipment.

With the Manufacturers

NOTES FROM THE FIELD

Combustion Engineering Has New Vice-President

Edwin H. Lundgren, for the past four years general sales manager of the *Combustion Engineering Corporation,* has recently been elected vice-president and general sales manager.

Mr. Lundgren is well known in the power plant field, having been actively identified with the stoker business since 1912. His association with the *Combustion Engineering Corporation* began in 1921 at which time he resigned as vice-president and chief engineer of the *Frederick Engineering Company,* Frederick, Maryland, to go to New York.

Mr. Lundgren is a graduate of the Swedish Government Technical College with a degree of Mechanical Engineer. He is an authority on the design and construction of stokers and the author of numerous technical articles.

Brown Branch

The Brown Instrument Company on September 1st opened an office at 509 Mutual Building, Kansas City, Missouri. *Mr. F. M. Poole* is the district manager.

General Manager of Jeffrey

The election of *Robert W. Gillispie* to the vice-presidency and general managership of the *Jeffrey Manufacturing Company* was announced on October 10.

Mr. Gillispie, who was for many years connected with the *Bethlehem Steel Company* in an executive capacity, joined the Jeffrey organization as vice president and assistant general manager in July of 1926.

Westinghouse Consolidations

The Westinghouse Electric and Manufacturing Company has made a number of changes in its merchandising department, as follows: *Mr. M. C. Morros* has been appointed sales manager of the merchandising department; *Mr. F. R. Kohnstamm* has been appointed assistant sales manager of the merchandising department.

The territory comprising the northeastern sales section and the Philadelphia district has been consolidated with respect to merchandising and will be known as the northeastern merchandising district. *George T. Kunklin* is appointed district merchandising distribution manager of this territory with headquarters in New York.

P. Y. Danley, formerly manager of the interior lighting section, is appointed district merchandising distribution manager of the territory comprising the present Pittsburgh, Cincinnati, and Detroit districts. These are consolidated with respect to merchandising and will be known as the north central merchandising district.

J. Paul Teller is appointed manager of the interior lighting section and will continue to be located at South Bend, Indiana.

INDUSTRIAL LITERATURE

Keystone Publication

A 60-page catalog, "*Keystone Blast Hole Drills,*" issued by the *Keystone Driller Company,* Beaver Falls, Pa., features portable well drills, traction and non-traction, for use in drilling blast holes. It contains also a discussion of the best methods of spacing holes, loading and shooting.

Fin Furnace Catalog

The Combustion Engineering Corporation, New York City, has completed the printing of its *Fin furnace catalog.* This product is a water-cooled furnace that eliminates wall maintenance and increases boiler capacity. Copies of the publication, *No. FF-2,* may be had upon request.

Flow Meter Publications

Some facts of interest on Brown electric flow meters, working on the inductance bridge principle, are contained in an attractive broadside newly issued by the Brown Instrument Company, Philadelphia, Pa.

"High Temperature Insulation"

The Celite Products Company lecture on "*High Temperature Insulation*" for 1927-8 has been printed in booklet form. It includes data on methods of measuring heat flow through walls as well as temperature gradients and heat losses through typical insulated and uninsulated walls. Drawings are included showing methods of insulating various types of high temperature equipment, such as boilers, furnaces, blast furnace stacks, open-hearth regenerators and flues.

Arcofrax Booklet

The General Refractories Company, Philadelphia, is distributing a 4-page, highly attractive booklet presenting a record of the performance of *Arcofrax* high alumina brick in the kilns of a western cement plant. At the time the booklet was prepared the lining was reported to be 328 days old and still in service.

Foster Wheeler Publications

The first publications to be issued by the recently organized *Foster Wheeler Corporation* are its bulletins numbered *EC*-102, 120 and 119.

Bulletin 102 describes the Foster *Economizer,* now widely used in power plants in the United States, Canada, Great Britain and Continental Europe. The new publication contains much test data, photographs, drawings and a steam table up to 1500 lbs. gauge pressure and 300 deg. Fahrenheit superheat.

Bulletin 120 covers the new *Extraction Type Feed Water Heaters* usually installed in turbo electric power stations. This bulletin includes heat balance diagrams and will be found of great assistance by steam plant designers.

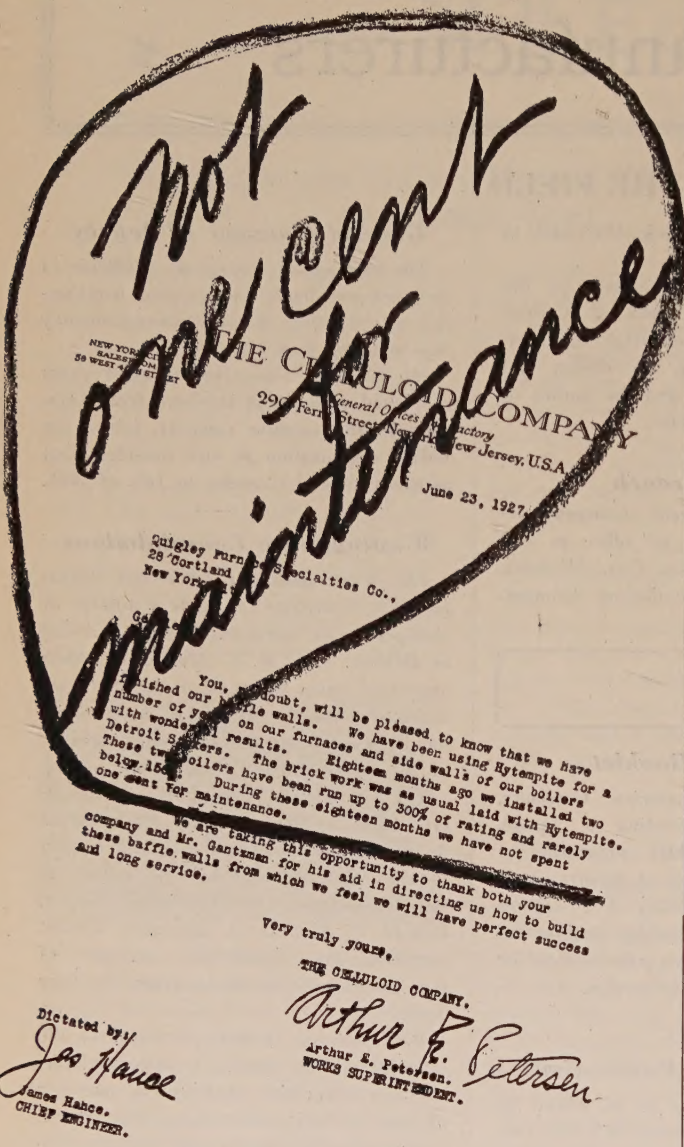
Bulletin 119 deals with hot water heating systems of the forced circulation type employing exhaust steam from the power plant as the source of heat. The bulletin contains photographs taken in nationally known plants and will show power plant engineers exactly how this system applies to the modern power station and heating problem.

Crawler Shovel Bulletin

Bulletin B-10 has been published by the *Link-Belt Company* to furnish complete revised dimensions and specifications on *Link-Belt Crawler Shovels.* Copies may be obtained at 910 S. Michigan Avenue, Chicago.

G-E Air Compressors

A four-page loose leaflet received from the *General Electric Company,* Schenectady, New York, describes its centrifugal air compressors. Seventy-five sizes have been redesigned, with greatly improved efficiency, and this circular gives the new specifications and construction details.



Not one cent for maintenance

NEW YORK CITY SALESROOM 58 WEST 4[illegible] STREET

THE CELLULOID COMPANY
General Offices and Factory
290 Ferry Street, Newark, New Jersey, U.S.A.

June 23, 1927.

Quigley Furnace Specialties Co.,
28 Cortland St.,
New York City.

Gentlemen:

You, no doubt, will be pleased to know that we have finished our baffle walls. We have been using Hytempite for a number of years on our furnaces and side walls of our boilers with wonderful results. Eighteen months ago we installed two Detroit Stokers. The brick work was as usual laid with Hytempite. These two boilers have been run up to 300% of rating and rarely below 150%. During these eighteen months we have not spent one cent for maintenance.

We are taking this opportunity to thank both your company and Mr. Gantzman for his aid in directing us how to build these baffle walls from which we feel we will have perfect success and long service.

Very truly yours,

THE CELLULOID COMPANY.

Arthur E. Petersen

Arthur E. Petersen.
WORKS SUPERINTENDENT.

Dictated by:
Jas Hance
James Hance.
CHIEF ENGINEER.

HYTEMPITE

Highly Recommended

Because it gives entire satisfaction both for laying up firebrick and for building monolithic baffles. Maintenance costs are practically eliminated.

Hytempite is a plastic refractory material, scientifically compounded for bonding firebrick, building monolithic baffles and walls, making special shapes and for general repair work.

***If you use Hytempite
you will be able to say,
"Not one cent for maintenance"***

QUIGLEY FURNACE SPECIALTIES CO., Inc.
26 CORTLANDT ST. NEW YORK CITY

Quick Service from Stock in Every Industrial Center
Visit our Booth, No. 89 at the New York Power Show

(Concluded from page 104)

The Hot Air Flues

Considerable trouble has been experienced at this plant by air leaks in the brick hot-air flues to and from the coal dryer, caused by temperature expansion. Monolithic concrete construction failed to help the situation. In the present flues, an attempt was made to overcome this difficulty by using hollow wall reinforced concrete construction, which has proved quite successful. Temperatures up to 400 degrees Fahrenheit have been handled without difficulty.

The design used is shown in Fig. 6. The flue walls consist of two plastered slabs 1¼ inches thick with an air space between them. The plaster on the inside or hot side of the flue is composed of 1 part portland cement to 1 part of ground fire brick. On the outside a mixture of 1 part portland cement to 2 parts of sand was used.

The theory of this design is that the inside plaster, taking the brunt of the heat, will probably crack, but the outside plaster will remain comparatively cool and tight.

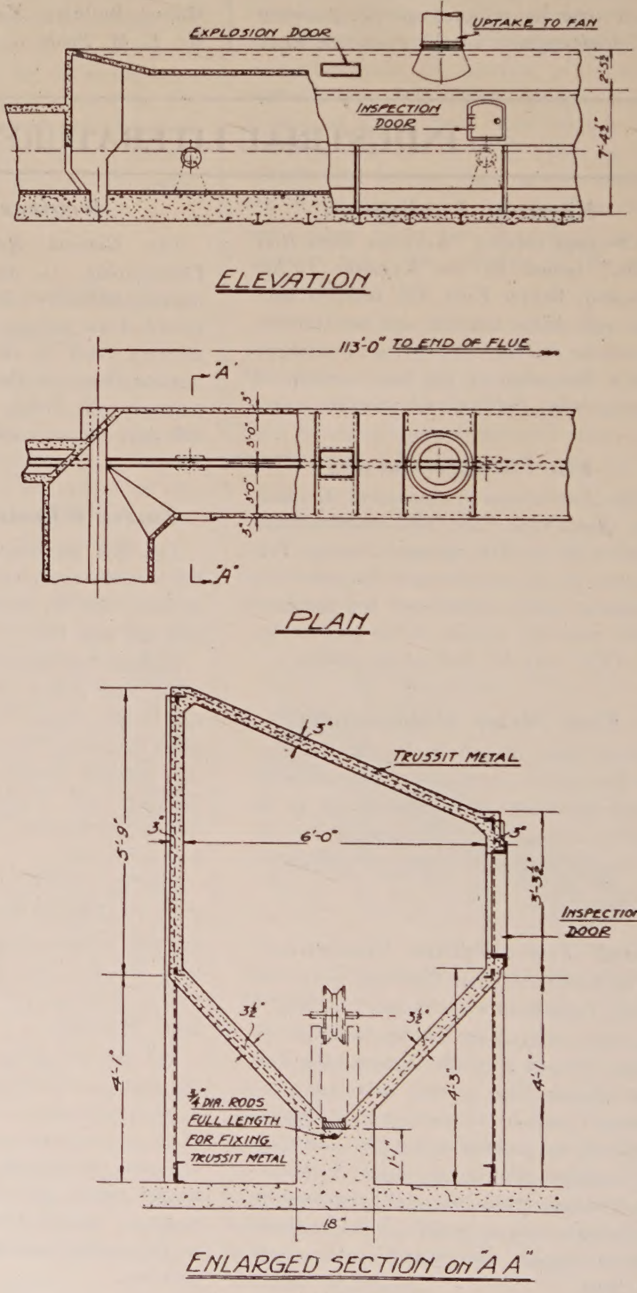


Fig. 6. Hot Air Flues